

EMISSIONS JANUARY 2019

EMISSION	UNIT	GT 1	GT 2	TOTAL
Gas	tons	7355.09	7091.20	14446
Oil	tons	0.00	0.00	0.00
Gas	MWh	83545	80547.8	164093
Oil	MWh	0.00	0.00	0.00
N0x Steam	tons	4989	4976	9966
7 % O2				
N0x	ppm	89.3	91.0	90.1
CO	ppm	16.0	6.2	11.2
PM	ppm			0.0
SO2	ppm	0.0	0.0	0.0
15 % O2				
N0x	ppm	37.9	38.6	38.3
CO	ppm	6.8	2.6	4.8
PM	ppm			0.0
SO2	ppm	0.0	0.0	0.0
N0x	mg/nm3	174.8	189.4	182.0
NO2	mg/nm3	261.1	282.9	271.8
CO	mg/nm3	30.1	11.7	21.1
PM	mg/nm3			0.0
SO2	mg/nm3	0.0	0.0	0.0
N0x	mg/MJ	159.1	172.4	165.6
NO2	mg/MJ	237.2	257.5	247.1
CO	mg/MJ	21.9	8.5	15.3
PM	mg/MJ			0.0
SO2	mg/MJ	0.0	0.0	0.0
N0x	tons	47.9	50.0	97.8
NO2	tons	71.3	74.7	146.0
CO	tons	6.6	2.5	9.1
PM	tons	0.0	0.0	0.0
SO2	tons	0.0	0.0	0.0

GT1 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/2/2019	35.37	2.76	1.85	34.47	7.00	15.45	92.35	1.10	0.13	Maintenance	
2/2/2019	36.80	2.85	1.95	35.04	7.17	15.34	91.92	1.13	0.13	Maintenance	
3/2/2019	38.72	3.02	2.05	35.81	6.46	15.21	91.90	1.21	0.13	Maintenance	
4/2/2019	37.24	2.93	1.91	35.30	6.42	15.29	91.74	1.18	0.12	Maintenance	
5/2/2019	34.18	2.74	1.86	33.06	7.89	15.50	89.25	1.07	0.14	Maintenance	
6/2/2019	35.71	2.83	1.90	33.67	7.03	15.37	88.99	1.10	0.13	Maintenance	
7/2/2019	36.63	2.92	1.83	35.87	6.58	15.35	94.34	1.21	0.13	Maintenance	
8/2/2019	36.50	2.86	1.90	34.76	6.91	15.36	91.67	1.14	0.13	Maintenance	
9/2/2019	36.44	2.87	1.83	35.80	6.61	15.33	93.86	1.17	0.12	Maintenance	
10/2/2019	38.25	3.02	1.89	34.97	6.35	15.19	89.31	1.20	0.12	Maintenance	
11/2/2019	33.75	2.72	1.68	34.06	7.83	15.45	90.72	1.08	0.14	Maintenance	
12/2/2019	36.20	2.90	1.83	35.39	6.92	15.35	93.01	1.19	0.13	Maintenance	
13/2/2019	35.63	2.87	1.68	35.78	6.60	15.37	94.35	1.19	0.12	Maintenance	
14/2/2019	35.94	2.89	1.71	36.03	6.87	15.34	94.39	1.21	0.13	Maintenance	
15/2/2019	35.45	2.88	1.60	43.82	6.33	15.43	97.68	1.23	0.12	Maintenance	
16/2/2019	36.92	3.02	1.87	36.16	6.51	15.31	94.47	1.27	0.13	Maintenance	
17/2/2019	38.77	3.17	2.11	34.71	6.20	15.18	88.50	1.26	0.13	Maintenance	
18/2/2019	38.89	3.18	2.07	35.21	6.19	15.15	89.38	1.28	0.13	Maintenance	
19/2/2019	33.00	2.77	1.67	34.16	6.72	15.54	92.80	1.13	0.13	Maintenance	
20/2/2019	35.23	2.90	1.72	34.67	6.78	15.35	91.15	1.17	0.13	Maintenance	
21/2/2019	36.55	2.97	1.82	34.79	6.60	15.33	91.12	1.20	0.13	Maintenance	
22/2/2019	36.07	2.92	1.88	34.61	6.97	15.35	90.88	1.18	0.13	Maintenance	
23/2/2019	36.79	2.99	1.78	35.96	5.78	15.32	93.98	1.25	0.11	Maintenance	
24/2/2019	38.55	3.17	1.79	36.55	6.03	15.14	92.57	1.33	0.13	Maintenance	
25/2/2019	37.48	3.09	1.77	36.69	5.89	15.23	94.37	1.30	0.12	Maintenance	
26/2/2019	36.29	3.00	1.74	38.95	6.61	15.37	95.25	1.26	0.13	Maintenance	
27/2/2019	37.25	3.07	1.84	35.42	5.65	15.22	91.35	1.27	0.11	Maintenance	
28/2/2019	36.75	3.03	1.82	34.82	5.79	15.31	90.91	1.24	0.12	Maintenance	
Minimum	33.00	2.72	1.60	33.06	5.65	15.14	88.50	1.07	0.11		
Average	36.48	2.94	1.83	35.59	6.60	15.33	92.22	1.20	0.13		
Maximum	38.89	3.18	2.11	43.82	7.89	15.54	97.68	1.33	0.14		
Sum								33.56	3.55		



B. Grimm Power (Laem Chabang) 1 Limited

GT2 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/2/2019	35.60	2.81	2.00	32.18	2.06	15.93	94.56	1.07	0.04	Maintenance	
2/2/2019	36.15	2.84	2.02	31.85	1.57	15.92	93.26	1.07	0.03	Maintenance	
3/2/2019	37.66	2.98	2.10	32.08	1.00	15.83	92.26	1.12	0.02	Maintenance	
4/2/2019	36.66	2.92	1.95	30.80	1.41	15.86	88.87	1.06	0.03	Maintenance	
5/2/2019	35.46	2.86	2.01	30.99	1.66	15.95	91.29	1.06	0.03	Maintenance	
6/2/2019	36.54	2.91	2.03	30.97	1.78	15.84	89.12	1.07	0.03	Maintenance	
7/2/2019	36.59	2.95	1.94	32.63	1.36	15.88	94.80	1.14	0.03	Maintenance	
8/2/2019	36.43	2.89	1.96	31.98	1.60	15.86	92.71	1.09	0.03	Maintenance	
9/2/2019	35.42	2.83	1.96	32.14	1.58	15.93	94.44	1.08	0.03	Maintenance	
10/2/2019	36.77	2.95	2.04	32.55	1.73	15.80	92.99	1.14	0.03	Maintenance	
11/2/2019	33.30	2.70	1.74	29.11	4.14	16.01	85.74	0.97	0.07	Maintenance	
12/2/2019	36.55	2.96	1.92	32.97	1.46	15.84	95.12	1.16	0.03	Maintenance	
13/2/2019	37.08	3.00	1.95	33.21	1.57	15.78	94.51	1.18	0.03	Maintenance	
14/2/2019	36.86	2.97	1.96	32.77	1.13	15.84	94.49	1.16	0.02	Maintenance	
15/2/2019	35.63	2.92	1.67	41.55	1.25	15.95	123.25	1.45	0.03	Maintenance	
16/2/2019	32.04	2.68	1.72	29.21	1.16	16.50	85.07	1.05	0.02	Maintenance	
17/2/2019	0.02	0.12	0.27	0.00	0.04	21.60	0.00	0.00	0.00	Maintenance	GT start-up
18/2/2019	0.06	0.13	0.28	0.09	0.16	21.02	0.00	0.00	0.00	Maintenance	GT start-up
19/2/2019	31.39	2.69	1.69	35.18	2.48	15.74	92.78	1.16	0.04	Maintenance	
20/2/2019	35.61	2.95	1.85	32.97	1.45	15.76	93.46	1.16	0.03	Maintenance	
21/2/2019	37.61	3.08	2.01	32.83	1.10	15.77	93.39	1.20	0.02	Maintenance	
22/2/2019	37.45	3.05	2.05	33.28	0.94	15.76	94.49	1.20	0.02	Maintenance	
23/2/2019	36.61	3.01	1.86	32.99	1.38	15.81	94.60	1.18	0.03	Maintenance	
24/2/2019	38.37	3.20	1.81	34.09	1.21	15.62	94.19	1.28	0.03	Maintenance	
25/2/2019	36.64	3.06	1.86	33.04	1.22	15.79	94.38	1.21	0.03	Maintenance	
26/2/2019	36.40	3.04	1.88	32.58	1.26	15.86	94.24	1.20	0.03	Maintenance	
27/2/2019	36.62	3.06	1.86	36.10	1.79	15.72	103.54	1.33	0.04	Maintenance	
28/2/2019	37.03	3.08	1.97	33.32	1.77	15.72	93.90	1.23	0.04	Maintenance	
Minimum	0.02	0.12	0.27	0.00	0.04	15.62	0.00	0.00	0.00		
Average	33.52	2.74	1.80	30.48	1.47	16.25	87.55	1.07	0.03		
Maximum	38.37	3.20	2.10	41.55	4.14	21.60	123.25	1.45	0.07		
Sum								30.02	0.80		

GT1 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/3/2019	36.11	2.99	1.74	35.01	6.42	15.29	90.92	1.23	0.13	Maintenance	
2/3/2019	34.97	2.91	1.81	34.05	7.16	15.36	89.53	1.18	0.14	Maintenance	
3/3/2019	38.52	3.18	1.71	37.25	6.23	15.10	93.79	1.35	0.13	Maintenance	
4/3/2019	36.58	3.04	1.82	35.64	7.34	15.31	93.10	1.27	0.15	Maintenance	
5/3/2019	36.87	3.05	1.83	36.35	6.19	15.32	94.97	1.30	0.13	Maintenance	
6/3/2019	37.06	3.06	1.80	35.95	6.38	15.30	93.64	1.28	0.13	Maintenance	
7/3/2019	37.87	3.09	1.85	36.59	6.20	15.24	94.25	1.30	0.13	Maintenance	
8/3/2019	37.15	3.05	1.87	35.08	7.02	15.28	90.92	1.24	0.14	Maintenance	
9/3/2019	35.96	2.97	1.82	34.92	7.19	15.33	90.81	1.21	0.14	Maintenance	
10/3/2019	38.90	3.19	1.81	37.30	6.92	15.13	94.29	1.36	0.14	Maintenance	
11/3/2019	38.16	3.10	1.85	36.49	5.35	15.22	93.73	1.30	0.11	Maintenance	
12/3/2019	36.78	3.01	1.76	35.83	6.11	15.32	93.77	1.25	0.12	Maintenance	
13/3/2019	36.78	2.99	1.80	35.73	7.15	15.30	93.17	1.24	0.14	Maintenance	
14/3/2019	37.18	2.97	1.78	36.34	6.39	15.34	93.55	1.20	0.12	Maintenance	
15/3/2019	37.61	3.00	1.88	35.09	5.93	15.25	90.61	1.21	0.12	Maintenance	
16/3/2019	36.28	2.93	1.96	35.26	6.90	15.41	93.65	1.20	0.13	Maintenance	
17/3/2019	37.59	3.07	1.90	35.80	5.75	15.25	92.57	1.27	0.12	Maintenance	
18/3/2019	37.35	2.98	1.89	35.79	5.96	15.26	92.51	1.23	0.12	Maintenance	
19/3/2019	36.60	2.94	1.74	34.88	7.18	15.25	89.82	1.19	0.14	Maintenance	
20/3/2019	36.55	2.94	1.77	34.95	7.28	15.28	90.88	1.19	0.14	Maintenance	
21/3/2019	36.89	3.03	1.64	36.31	6.21	15.27	94.22	1.28	0.12	Maintenance	
22/3/2019	36.66	3.02	1.72	35.76	6.28	15.28	92.87	1.26	0.13	Maintenance	
23/3/2019	34.50	2.88	1.78	34.75	6.81	15.47	93.43	1.19	0.13	Maintenance	
24/3/2019	38.63	3.21	1.63	37.39	7.11	15.08	93.69	1.37	0.15	Maintenance	
25/3/2019	38.20	3.15	1.76	36.02	4.79	15.18	91.94	1.31	0.10	Maintenance	
26/3/2019	36.04	2.98	1.65	35.64	6.32	15.31	92.93	1.24	0.12	Maintenance	
27/3/2019	36.22	2.98	1.65	37.86	5.99	15.32	94.77	1.26	0.12	Maintenance	
28/3/2019	36.31	3.00	1.65	36.10	6.24	15.30	93.93	1.26	0.12	Maintenance	
29/3/2019	35.98	3.00	1.63	35.87	6.61	15.30	93.57	1.26	0.13	Maintenance	
30/3/2019	34.50	2.91	1.72	35.00	7.12	15.41	92.95	1.21	0.14	Maintenance	
31/3/2019	37.57	3.13	1.73	36.50	5.88	15.20	93.44	1.32	0.12	Maintenance	
Minimum	34.50	2.88	1.63	34.05	4.79	15.08	89.53	1.18	0.10		
Average	36.85	3.02	1.77	35.86	6.46	15.28	92.85	1.26	0.13		
Maximum	38.90	3.21	1.96	37.86	7.34	15.47	94.97	1.37	0.15		
Sum								38.95	4.00		

GT2 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/3/2019	37.18	3.10	1.93	33.80	1.31	15.69	94.67	1.25	0.03	Maintenance	
2/3/2019	37.05	3.09	1.89	33.96	1.07	15.66	94.56	1.25	0.02	Maintenance	
3/3/2019	38.08	3.17	1.83	34.55	1.00	15.52	93.84	1.29	0.02	Maintenance	
4/3/2019	36.83	3.09	1.79	34.25	1.12	15.65	95.18	1.27	0.02	Maintenance	
5/3/2019	36.59	3.06	1.90	33.56	0.81	15.71	94.40	1.24	0.02	Maintenance	
6/3/2019	36.76	3.07	1.86	33.77	1.04	15.69	94.46	1.25	0.02	Maintenance	
7/3/2019	36.14	3.00	1.82	33.22	1.19	15.78	94.58	1.20	0.02	Maintenance	
8/3/2019	37.13	3.08	1.85	33.85	1.07	15.68	94.56	1.25	0.02	Maintenance	
9/3/2019	34.74	2.91	1.79	32.78	1.28	15.97	91.09	1.17	0.02	Maintenance	
10/3/2019	0.02	0.12	0.27	0.03	0.03	21.68	0.00	0.00	0.00	Maintenance	GT start-up
11/3/2019	26.58	2.27	1.35	29.20	2.09	16.91	75.74	1.02	0.02	Maintenance	
12/3/2019	36.58	3.04	1.83	33.48	1.19	15.74	94.74	1.22	0.02	Maintenance	
13/3/2019	36.65	3.01	1.83	32.77	0.99	15.84	94.41	1.18	0.02	Maintenance	
14/3/2019	36.90	2.98	1.87	34.07	1.12	15.83	98.26	1.20	0.02	Maintenance	
15/3/2019	36.93	2.99	1.95	32.54	1.40	15.83	93.66	1.15	0.03	Maintenance	
16/3/2019	36.24	2.96	1.98	32.41	1.42	15.92	94.98	1.15	0.03	Maintenance	
17/3/2019	38.52	3.18	1.97	33.76	1.68	15.66	94.00	1.26	0.04	Maintenance	
18/3/2019	37.99	3.06	1.93	33.21	0.94	15.75	94.21	1.18	0.02	Maintenance	
19/3/2019	37.50	3.03	1.96	33.09	1.16	15.79	94.49	1.17	0.02	Maintenance	
20/3/2019	36.99	3.00	1.92	31.81	0.67	15.85	92.09	1.13	0.01	Maintenance	
21/3/2019	36.64	3.04	1.77	32.65	0.88	15.88	94.98	1.19	0.02	Maintenance	
22/3/2019	36.56	3.05	1.77	31.94	0.92	15.96	94.43	1.17	0.02	Maintenance	
23/3/2019	33.58	2.84	1.66	30.40	0.95	16.27	90.86	1.07	0.02	Maintenance	
24/3/2019	0.02	0.12	0.27	0.01	0.05	21.69	0.00	0.00	0.00	Maintenance	GT start-up
25/3/2019	27.18	2.34	1.44	26.83	2.31	16.98	71.03	0.95	0.03	Maintenance	
26/3/2019	36.18	3.02	1.95	32.14	2.18	15.96	94.94	1.17	0.04	Maintenance	
27/3/2019	36.02	2.99	1.86	31.69	1.68	16.02	94.79	1.14	0.03	Maintenance	
28/3/2019	35.49	2.97	1.74	36.08	1.49	16.08	109.77	1.28	0.03	Maintenance	
29/3/2019	35.24	2.98	1.79	31.44	1.33	16.07	94.97	1.14	0.03	Maintenance	
30/3/2019	35.93	3.05	1.74	31.44	1.16	15.99	93.27	1.15	0.02	Maintenance	
31/3/2019	37.28	3.14	1.87	31.92	1.14	15.94	93.94	1.19	0.02	Maintenance	
Minimum	0.02	0.12	0.27	0.01	0.03	15.52	0.00	0.00	0.00		
Average	33.60	2.80	1.72	30.54	1.18	16.29	87.32	1.10	0.02		
Maximum	38.52	3.18	1.98	36.08	2.31	21.69	109.77	1.29	0.04		
Sum								34.25	0.71		

GT1 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/4/2019	37.57	3.13	1.77	36.23	6.91	15.19	92.73	1.31	0.14	Maintenance	
2/4/2019	36.02	3.01	1.72	35.13	6.83	15.29	91.33	1.24	0.13	Maintenance	
3/4/2019	36.24	3.03	1.66	35.91	6.36	15.29	93.45	1.28	0.13	Maintenance	
4/4/2019	36.10	2.99	1.75	35.71	5.92	15.36	94.11	1.26	0.12	Maintenance	
5/4/2019	36.06	3.01	1.65	36.16	6.22	15.30	94.13	1.28	0.13	Maintenance	
6/4/2019	35.96	3.01	1.67	35.91	6.58	15.30	93.54	1.27	0.13	Maintenance	
7/4/2019	37.50	3.10	1.97	34.94	7.42	15.20	89.66	1.26	0.15	Maintenance	
8/4/2019	36.43	3.05	1.75	35.47	7.06	15.24	91.32	1.26	0.14	Maintenance	
9/4/2019	35.84	2.99	1.75	34.47	8.74	15.28	89.77	1.21	0.17	Maintenance	
10/4/2019	36.33	3.01	1.79	35.42	7.19	15.20	87.56	1.20	0.14	Maintenance	
11/4/2019	35.88	2.93	2.02	30.93	7.96	15.27	76.31	1.08	0.15	Maintenance	
12/4/2019	-0.02	0.07	0.12	1.42	2.53	20.96	0.00	0.00	0.00	Maintenance	GT start-up
13/4/2019	-0.02	0.06	0.12	1.16	1.52	20.96	0.00	0.00	0.00	Maintenance	GT start-up
14/4/2019	-0.02	0.06	0.05	0.82	1.13	20.96	0.00	0.00	0.00	Maintenance	GT start-up
15/4/2019	-0.02	0.05	0.16	0.92	1.26	20.95	0.00	0.00	0.00	Maintenance	GT start-up
16/4/2019	-0.01	0.04	0.17	0.86	1.40	20.96	0.00	0.00	0.00	Maintenance	GT start-up
17/4/2019	-0.01	0.04	0.16	0.83	1.43	20.96	0.00	0.00	0.00	Maintenance	GT start-up
18/4/2019	22.64	1.92	1.13	27.99	7.30	16.99	64.36	0.74	0.09	Maintenance	
19/4/2019	29.51	2.49	1.53	31.87	9.63	15.66	88.41	0.99	0.16	Maintenance	
20/4/2019	30.28	2.58	1.56	33.22	8.17	15.60	91.31	1.07	0.15	Maintenance	
21/4/2019	36.82	3.06	1.69	36.35	6.37	15.18	92.66	1.29	0.13	Maintenance	
22/4/2019	37.00	3.09	1.66	37.35	7.90	14.91	92.62	1.34	0.16	Maintenance	
23/4/2019	36.48	3.04	1.67	36.64	5.81	15.18	93.34	1.30	0.12	Maintenance	
24/4/2019	36.24	3.02	1.53	42.67	5.17	15.18	96.13	1.31	0.10	Maintenance	
25/4/2019	36.68	3.01	1.74	34.67	4.98	15.17	88.44	1.21	0.10	Maintenance	
26/4/2019	36.01	2.92	1.74	35.48	6.07	15.24	91.51	1.20	0.12	Maintenance	
27/4/2019	33.74	2.77	1.65	35.27	5.64	15.48	89.51	1.16	0.10	Maintenance	
28/4/2019	-0.02	0.20	0.18	1.41	2.58	20.97	0.00	0.00	0.00	Maintenance	GT start-up
29/4/2019	26.86	2.32	1.11	29.91	4.71	16.57	67.54	0.96	0.06	Maintenance	
30/4/2019	36.82	3.06	1.65	36.70	5.95	15.18	93.56	1.31	0.12	Maintenance	
Minimum	-0.02	0.04	0.05	0.82	1.13	14.91	0.00	0.00	0.00		
Average	26.63	2.24	1.30	27.06	5.56	16.70	68.11	0.92	0.10		
Maximum	37.57	3.13	2.02	42.67	9.63	20.97	96.13	1.34	0.17		
Sum								27.54	2.95		

GT2 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/4/2019	36.41	3.07	1.90	31.19	1.47	16.02	93.24	1.16	0.03	Maintenance	
2/4/2019	36.71	3.09	1.87	31.30	1.05	15.97	92.60	1.16	0.02	Maintenance	
3/4/2019	36.23	3.06	1.86	31.37	1.88	15.95	92.48	1.16	0.04	Maintenance	
4/4/2019	36.41	3.05	1.96	31.36	1.91	16.01	93.49	1.15	0.04	Maintenance	
5/4/2019	35.85	3.03	1.92	31.44	2.28	16.02	93.89	1.15	0.05	Maintenance	
6/4/2019	35.15	2.98	1.90	30.67	2.11	16.07	92.60	1.11	0.04	Maintenance	
7/4/2019	38.08	3.18	1.96	31.20	1.46	15.86	90.27	1.17	0.03	Maintenance	
8/4/2019	36.26	3.07	1.78	30.87	1.29	16.05	92.62	1.14	0.03	Maintenance	
9/4/2019	35.93	3.04	1.78	30.89	1.60	16.02	92.34	1.12	0.03	Maintenance	
10/4/2019	36.00	3.03	1.72	34.56	1.22	15.96	102.30	1.25	0.03	Maintenance	
11/4/2019	38.16	3.15	2.14	30.14	1.62	15.68	84.16	1.13	0.03	Maintenance	
12/4/2019	38.10	3.13	2.11	30.28	0.92	15.74	85.51	1.13	0.02	Maintenance	
13/4/2019	37.24	3.06	2.16	31.78	0.76	15.73	89.74	1.16	0.02	Maintenance	
14/4/2019	23.05	2.13	0.50	45.07	2.57	16.90	171.73	1.35	0.05	Maintenance	
15/4/2019	34.85	2.90	1.80	29.91	1.70	15.85	86.34	1.04	0.03	Maintenance	
16/4/2019	35.56	2.91	1.97	29.82	2.30	16.00	88.72	1.03	0.05	Maintenance	
17/4/2019	37.77	3.03	2.04	31.25	1.57	15.81	89.55	1.10	0.03	Maintenance	
18/4/2019	34.31	2.80	1.92	29.65	2.41	16.03	89.07	1.00	0.05	Maintenance	
19/4/2019	30.87	2.60	1.66	28.06	3.62	16.25	87.34	0.93	0.06	Maintenance	
20/4/2019	31.82	2.72	1.71	28.81	2.99	16.17	88.34	0.99	0.05	Maintenance	
21/4/2019	36.74	3.09	1.89	32.39	1.26	15.83	93.12	1.18	0.03	Maintenance	
22/4/2019	36.83	3.11	1.89	31.71	1.30	15.84	91.79	1.17	0.03	Maintenance	
23/4/2019	35.64	3.01	1.96	31.85	1.44	15.98	94.31	1.16	0.03	Maintenance	
24/4/2019	35.22	2.98	1.78	33.49	1.68	16.12	102.58	1.19	0.03	Maintenance	
25/4/2019	35.62	2.96	1.89	30.77	2.01	16.15	94.56	1.09	0.04	Maintenance	
26/4/2019	35.76	2.93	2.05	30.70	2.60	16.13	93.83	1.07	0.05	Maintenance	
27/4/2019	35.74	2.96	1.83	30.53	1.08	16.16	93.95	1.07	0.02	Maintenance	
28/4/2019	37.89	3.17	1.92	29.08	0.87	16.02	87.06	1.09	0.02	Maintenance	
29/4/2019	37.61	3.16	1.98	31.24	1.53	15.95	91.93	1.16	0.03	Maintenance	
30/4/2019	35.59	3.00	1.83	33.65	1.33	16.15	103.98	1.21	0.03	Maintenance	
Minimum	23.05	2.13	0.50	28.06	0.76	15.68	84.16	0.93	0.02		
Average	35.58	2.98	1.86	31.50	1.73	16.01	94.78	1.13	0.03		
Maximum	38.16	3.18	2.16	45.07	3.62	16.90	171.73	1.35	0.06		
Sum								33.84	1.04		



B. Grimm Power (Laem Chabang) 1 Limited

GT1 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/5/2019	31.84	2.72	1.86	30.23	8.11	15.52	81.91	1.01	0.15	Maintenance	
2/5/2019	36.79	3.07	1.70	36.09	5.54	15.21	92.37	1.29	0.11	Maintenance	
3/5/2019	36.57	3.07	1.70	35.96	5.63	15.16	91.43	1.29	0.11	Maintenance	
4/5/2019	35.42	2.97	1.71	35.70	5.90	15.29	92.80	1.26	0.12	Maintenance	
5/5/2019	38.58	3.19	1.77	36.73	6.64	15.04	91.38	1.35	0.14	Maintenance	
6/5/2019	31.67	2.72	1.61	33.11	6.74	15.41	87.92	1.09	0.13	Maintenance	
7/5/2019	33.54	2.88	1.55	34.73	7.93	15.31	90.12	1.22	0.15	Maintenance	
8/5/2019	36.51	3.05	1.73	35.42	5.67	15.18	90.40	1.26	0.12	Maintenance	
9/5/2019	36.19	2.99	1.82	36.10	6.36	15.23	92.98	1.26	0.13	Maintenance	
10/5/2019	36.10	2.99	1.74	36.42	5.50	15.22	93.45	1.27	0.11	Maintenance	
11/5/2019	34.97	2.89	1.93	35.52	6.68	15.36	93.51	1.21	0.13	Maintenance	
12/5/2019	36.90	3.05	1.97	35.78	6.26	15.21	91.74	1.27	0.13	Maintenance	
13/5/2019	36.80	3.07	1.64	39.25	4.81	15.16	94.21	1.33	0.10	Maintenance	
14/5/2019	36.38	3.04	1.65	36.56	5.54	15.20	93.56	1.31	0.11	Maintenance	
15/5/2019	36.21	3.03	1.59	36.92	5.85	15.17	94.08	1.32	0.12	Maintenance	
16/5/2019	36.58	3.01	1.78	34.43	5.49	15.19	88.24	1.21	0.11	Maintenance	
17/5/2019	36.08	2.96	1.76	36.26	5.43	15.24	93.38	1.25	0.11	Maintenance	
18/5/2019	30.37	2.59	1.56	32.96	5.27	15.50	88.92	1.03	0.09	Maintenance	
19/5/2019	35.91	2.94	1.80	35.93	5.63	15.30	93.73	1.24	0.11	Maintenance	
20/5/2019	35.95	2.92	1.81	35.66	6.15	15.25	92.43	1.21	0.12	Maintenance	
21/5/2019	34.16	2.77	1.70	34.89	6.17	15.25	89.99	1.12	0.11	Maintenance	
22/5/2019	35.96	2.88	1.82	35.32	6.21	15.25	91.31	1.18	0.12	Maintenance	
23/5/2019	36.58	2.96	1.73	36.64	6.52	15.20	93.85	1.26	0.13	Maintenance	
24/5/2019	36.31	2.97	1.66	36.81	4.85	15.21	94.42	1.28	0.09	Maintenance	
25/5/2019	33.48	2.77	1.80	34.90	6.66	15.46	93.54	1.16	0.13	Maintenance	
26/5/2019	37.05	3.08	1.86	36.76	4.92	15.16	93.45	1.32	0.10	Maintenance	
27/5/2019	37.91	3.15	1.79	36.55	5.62	15.08	91.67	1.33	0.12	Maintenance	
28/5/2019	36.42	3.02	1.75	35.34	5.18	15.21	90.69	1.25	0.10	Maintenance	
29/5/2019	36.12	3.01	1.64	35.88	7.25	15.15	91.42	1.27	0.14	Maintenance	
30/5/2019	35.95	2.92	1.68	34.93	5.44	15.26	90.55	1.18	0.11	Maintenance	
31/5/2019	36.02	2.83	1.58	36.27	6.57	15.26	93.79	1.17	0.12	Maintenance	
Minimum	30.37	2.59	1.55	30.23	4.81	15.04	81.91	1.01	0.09		
Average	35.66	2.95	1.73	35.61	6.02	15.25	91.72	1.23	0.12		
Maximum	38.58	3.19	1.97	39.25	8.11	15.52	94.42	1.35	0.15		
Sum								38.20	3.65		

GT2 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/5/2019	31.58	2.73	1.89	26.33	3.54	16.41	84.98	0.92	0.07	Maintenance	
2/5/2019	35.59	3.02	1.98	30.75	1.85	16.09	93.09	1.12	0.04	Maintenance	
3/5/2019	35.32	3.00	1.91	30.71	1.95	16.10	93.38	1.11	0.04	Maintenance	
4/5/2019	33.83	2.88	1.75	30.79	1.49	16.30	92.50	1.09	0.03	Maintenance	
5/5/2019	0.02	0.12	0.28	0.03	0.10	21.68	0.00	0.00	0.00	Maintenance	GT start-up
6/5/2019	19.49	1.82	1.08	19.90	3.25	17.55	58.83	0.60	0.03	Maintenance	
7/5/2019	33.27	2.88	1.68	29.30	3.08	16.20	90.41	1.06	0.06	Maintenance	
8/5/2019	36.83	3.11	1.83	31.61	1.71	16.00	94.00	1.17	0.04	Maintenance	
9/5/2019	36.81	3.07	2.04	31.76	2.33	16.02	94.96	1.16	0.05	Maintenance	
10/5/2019	37.13	3.09	1.99	31.76	2.64	16.04	95.22	1.17	0.06	Maintenance	
11/5/2019	35.05	2.93	1.95	30.47	1.48	16.20	94.48	1.08	0.03	Maintenance	
12/5/2019	38.33	3.19	1.90	32.22	1.42	15.88	93.53	1.21	0.03	Maintenance	
13/5/2019	37.58	3.16	1.98	32.04	1.67	15.97	94.70	1.21	0.04	Maintenance	
14/5/2019	36.53	3.07	2.04	31.84	2.02	16.00	94.68	1.18	0.04	Maintenance	
15/5/2019	36.63	3.09	1.96	31.78	1.96	15.99	94.41	1.18	0.04	Maintenance	
16/5/2019	36.81	3.05	1.91	31.42	1.74	15.98	93.16	1.14	0.04	Maintenance	
17/5/2019	37.01	3.06	1.97	31.99	1.90	15.98	94.84	1.17	0.04	Maintenance	
18/5/2019	30.43	2.60	1.82	29.31	3.33	16.37	94.18	0.96	0.06	Maintenance	
19/5/2019	36.94	3.04	2.26	31.90	3.43	15.95	94.14	1.16	0.07	Maintenance	
20/5/2019	35.82	2.94	2.00	28.77	1.26	16.09	87.18	1.01	0.02	Maintenance	
21/5/2019	34.35	2.81	1.82	29.13	2.22	16.13	88.77	0.98	0.04	Maintenance	
22/5/2019	36.12	2.92	1.92	30.02	1.73	16.12	91.72	1.04	0.03	Maintenance	
23/5/2019	36.47	2.99	1.96	31.37	2.04	16.08	94.97	1.12	0.04	Maintenance	
24/5/2019	35.81	2.97	1.90	31.02	1.43	16.14	94.99	1.11	0.03	Maintenance	
25/5/2019	34.56	2.89	1.78	30.37	1.11	16.20	94.31	1.07	0.02	Maintenance	
26/5/2019	36.25	3.06	1.82	31.43	0.97	16.09	95.31	1.16	0.02	Maintenance	
27/5/2019	36.69	3.09	1.90	31.09	1.49	16.03	93.21	1.15	0.03	Maintenance	
28/5/2019	36.14	3.04	1.71	35.33	1.18	16.09	108.09	1.28	0.02	Maintenance	
29/5/2019	36.32	3.05	1.86	30.34	2.16	15.96	89.98	1.12	0.04	Maintenance	
30/5/2019	36.53	2.99	1.79	31.74	1.96	15.92	93.01	1.12	0.04	Maintenance	
31/5/2019	35.82	2.85	1.83	31.25	2.36	15.99	92.82	1.04	0.04	Maintenance	
Minimum	0.02	0.12	0.28	0.03	0.10	15.88	0.00	0.00	0.00		
Average	34.07	2.85	1.82	29.61	1.96	16.31	89.35	1.06	0.04		
Maximum	38.33	3.19	2.26	35.33	3.54	21.68	108.09	1.28	0.07		
Sum								32.88	1.19		

GT1 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/6/2019	36.31	2.85	1.57	35.63	6.24	15.20	91.14	1.15	0.11	Maintenance	
2/6/2019	37.73	2.97	1.71	35.30	7.29	15.13	89.30	1.18	0.14	Maintenance	
3/6/2019	33.13	2.70	1.60	33.48	9.74	15.37	87.97	1.07	0.17	Maintenance	
4/6/2019	36.32	2.88	1.78	35.08	6.22	15.23	90.18	1.15	0.12	Maintenance	
5/6/2019	36.18	2.86	1.70	35.35	6.83	15.25	91.30	1.15	0.13	Maintenance	
6/6/2019	35.93	2.86	1.66	35.73	6.65	15.29	92.62	1.17	0.12	Maintenance	
7/6/2019	35.73	2.87	1.65	35.97	6.92	15.30	93.66	1.20	0.13	Maintenance	
8/6/2019	31.21	2.56	1.55	33.18	6.18	15.67	86.86	1.02	0.11	Maintenance	
9/6/2019	-0.02	0.09	0.12	1.06	3.91	20.98	0.00	0.00	0.00	Maintenance	GT start-up
10/6/2019	26.80	2.25	1.15	30.85	5.33	16.57	70.66	0.91	0.06	Maintenance	
11/6/2019	35.75	2.92	1.83	35.39	11.52	15.26	91.33	1.21	0.22	Maintenance	
12/6/2019	35.59	2.93	1.68	35.28	4.71	15.22	90.87	1.21	0.09	Maintenance	
13/6/2019	35.53	2.96	1.61	36.18	6.18	15.22	92.95	1.26	0.12	Maintenance	
14/6/2019	35.95	2.99	1.69	34.34	6.85	15.17	87.44	1.21	0.14	Maintenance	
15/6/2019	33.08	2.78	1.69	34.81	6.82	15.44	93.14	1.17	0.13	Maintenance	
16/6/2019	35.73	2.99	1.83	34.53	6.61	15.27	89.47	1.22	0.13	Maintenance	
17/6/2019	36.07	3.02	1.74	35.84	6.96	15.19	91.35	1.27	0.14	Maintenance	
18/6/2019	35.91	3.00	1.59	38.39	5.97	15.22	93.35	1.28	0.12	Maintenance	
19/6/2019	36.78	3.05	1.76	36.38	7.38	15.16	92.48	1.29	0.15	Maintenance	
20/6/2019	36.47	3.02	1.73	35.63	6.30	15.17	90.80	1.25	0.13	Maintenance	
21/6/2019	36.45	3.02	1.75	35.38	5.59	15.20	90.71	1.24	0.11	Maintenance	
22/6/2019	34.00	2.85	1.76	34.67	7.39	15.43	92.47	1.18	0.14	Maintenance	
23/6/2019	36.07	3.00	1.78	34.46	6.11	15.25	89.01	1.21	0.12	Maintenance	
24/6/2019	36.79	3.06	1.60	35.96	6.61	15.16	91.57	1.28	0.13	Maintenance	
25/6/2019	38.69	3.20	1.58	37.18	6.38	14.95	91.53	1.35	0.13	Maintenance	
26/6/2019	38.15	3.14	1.81	34.87	6.47	15.06	87.32	1.27	0.13	Maintenance	
27/6/2019	35.80	2.98	1.73	34.75	6.24	15.21	89.09	1.21	0.12	Maintenance	
28/6/2019	35.91	2.99	1.71	35.72	5.90	15.26	92.48	1.26	0.12	Maintenance	
29/6/2019	33.16	2.78	1.69	34.71	6.26	15.44	92.46	1.16	0.12	Maintenance	
30/6/2019	35.89	2.95	1.85	34.96	6.11	15.32	91.31	1.21	0.12	Maintenance	
Minimum	-0.02	0.09	0.12	1.06	3.91	14.95	0.00	0.00	0.00		
Average	34.24	2.82	1.63	34.04	6.59	15.49	87.16	1.16	0.12		
Maximum	38.69	3.20	1.85	38.39	11.52	20.98	93.66	1.35	0.22		
Sum								34.75	3.71		

GT2 EMISSION REPORT

Total emission Total emission

	Electricity MW	Gas kg/s	Steam injection kg/s	NO ppm	CO ppm	O2 O2	NOx ppm (7 %-O2)	NOx t	CO t	Maintenance	GT-Start-up
1/6/2019	33.60	2.68	1.72	28.87	2.07	16.30	86.60	0.93	0.04	Maintenance	
2/6/2019	2.32	0.34	0.34	3.52	1.56	21.10	8.48	0.08	0.01	Maintenance	GT start-up
3/6/2019	33.50	2.75	1.53	29.06	2.53	15.86	83.43	0.97	0.04	Maintenance	
4/6/2019	35.62	2.87	1.73	28.28	1.79	16.07	85.07	0.95	0.03	Maintenance	
5/6/2019	36.23	2.90	1.68	30.71	1.40	16.02	91.86	1.04	0.03	Maintenance	
6/6/2019	36.15	2.91	1.69	31.18	1.46	16.02	92.97	1.06	0.03	Maintenance	
7/6/2019	36.23	2.94	1.64	31.37	1.44	16.06	94.45	1.09	0.03	Maintenance	
8/6/2019	35.44	2.89	1.86	31.77	2.56	15.99	94.45	1.10	0.05	Maintenance	
9/6/2019	38.95	3.18	2.09	30.36	3.21	15.77	86.12	1.13	0.07	Maintenance	
10/6/2019	38.09	3.12	1.79	31.34	1.71	15.83	90.25	1.14	0.04	Maintenance	
11/6/2019	36.14	2.99	1.65	31.10	0.90	16.01	92.85	1.10	0.02	Maintenance	
12/6/2019	36.20	3.00	1.92	31.88	3.03	15.95	93.98	1.15	0.06	Maintenance	
13/6/2019	35.78	3.00	1.73	31.39	2.54	16.03	94.08	1.13	0.05	Maintenance	
14/6/2019	35.73	3.01	1.88	29.76	2.48	15.98	88.64	1.08	0.05	Maintenance	
15/6/2019	35.34	2.98	1.73	31.73	2.27	15.97	93.90	1.14	0.05	Maintenance	
16/6/2019	38.27	3.21	1.85	32.10	2.03	15.77	91.36	1.21	0.04	Maintenance	
17/6/2019	37.36	3.15	1.82	32.66	1.58	15.88	94.72	1.22	0.03	Maintenance	
18/6/2019	36.94	3.11	1.72	32.40	1.87	15.89	94.29	1.20	0.04	Maintenance	
19/6/2019	36.07	3.03	1.77	31.72	2.25	15.99	94.16	1.15	0.05	Maintenance	
20/6/2019	35.70	3.00	1.67	31.19	2.00	15.99	92.85	1.12	0.04	Maintenance	
21/6/2019	35.74	3.00	1.92	31.05	2.68	15.96	91.50	1.13	0.06	Maintenance	
22/6/2019	34.54	2.92	1.68	35.64	2.79	15.98	105.98	1.26	0.06	Maintenance	
23/6/2019	38.26	3.21	1.71	32.35	1.98	15.71	90.89	1.21	0.04	Maintenance	
24/6/2019	38.47	3.22	1.64	33.40	1.72	15.71	93.95	1.26	0.04	Maintenance	
25/6/2019	38.60	3.22	1.74	32.82	1.88	15.67	91.84	1.24	0.04	Maintenance	
26/6/2019	38.46	3.20	1.94	32.41	1.84	15.81	92.93	1.22	0.04	Maintenance	
27/6/2019	35.87	3.01	1.91	31.28	2.21	16.00	93.27	1.14	0.05	Maintenance	
28/6/2019	36.33	3.05	1.98	32.00	2.32	15.96	94.64	1.18	0.05	Maintenance	
29/6/2019	34.81	2.92	1.95	31.26	2.64	16.06	94.30	1.12	0.05	Maintenance	
30/6/2019	38.51	3.17	2.11	32.63	2.49	15.79	93.15	1.22	0.05	Maintenance	
Minimum	2.32	0.34	0.34	3.52	0.90	15.67	8.48	0.08	0.01		
Average	35.31	2.93	1.75	30.57	2.11	16.10	89.57	1.10	0.04		
Maximum	38.95	3.22	2.11	35.64	3.21	21.10	105.98	1.26	0.07		
Sum								32.97	1.27		

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs2 Description HRSG2 Stack Emission Measurements
Process System. SAMPLING SYSTEM
Manufacturer SIEMENS
Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1
Serial no. F-Nr. N1-X9-008

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm
NOx measuring range 0 - 500 ppm O2 measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc
Cirtify Date 9-11.11.-14 Expired Date 10-11.11.-22 NO = 79.5 ppm
Cylinder No. CC452043 CO = 80.6 ppm
O2 = 0 %

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	80.40	80.60	-0.25	0.00
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	80.10	79.50	0.75	0.00

O2 Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O2	0.00	0.00	0.00	0.00	0.00
O2	20.90	20.90	20.90	0.00	0.00

Calibration date. 29/1/2019 Accuracy Target 1%
Resulted PASSED
Calibrated by. Mr. Phattharapong(Engnieer) Approved by.

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs2 Description HRSG2 Stack Emission Measurements
Process System. SAMPLING SYSTEM
Manufacturer SIEMENS
Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1
Serial no. F-Nr. N1-X9-008

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm
NOx measuring range 0 - 500 ppm O₂ measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc
Cirtify Date 9-ธ.ค.-14 Expired Date 10-ธ.ค.-22 NO = 79.5 ppm
Cylinder No. CC452043 CO = 80.6 ppm
O₂ = 0 %

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	82.70	80.60	2.61	0.00
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	78.20	79.50	-1.64	0.00

O₂ Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O ₂	0.00	0.00	0.00	0.00	0.00
O ₂	20.90	20.90	20.90	0.00	0.00

Calibration date. 15/2/2019

Accuracy Target 1%

Resulted PASSED

Calibrated by. Mr. Kitiphum(Engnieer)

Approved by.

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs1 Description HRSG1 Stack Emission Measurements
Process System. SAMPLING SYSTEM
Manufacturer SIEMENS
Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1
Serial no. F-Nr. N1-B1-385

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm
NOx measuring range 0 - 500 ppm O₂ measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc
Cirtify Date 9-๕.๓.-14 Expired Date 10-๕.๓.-22 NO = 79.5 ppm
Cylinder No. CC452043 CO = 80.6 ppm
O₂ = 0 %

Cylinder No.

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	82.70	80.60	2.61	0.00
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	78.50	79.50	-1.26	0.00

O₂ Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O ₂	0.00	0.00	0.00	0.00	0.00
O ₂	20.90	20.90	20.90	0.00	0.00

Calibration date. 22/3/2019 Accuracy Target 1%
Resulted PASSED
Calibrated by. Mr. Kitiphum(Engnieer) Approved by.

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs2 Description HRSG2 Stack Emission Measurements
Process System. SAMPLING SYSTEM
Manufacturer SIEMENS
Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1
Serial no. F-Nr. N1-X9-008

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm
NOx measuring range 0 - 500 ppm O2 measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc
Cirtify Date 9-11-14 Expired Date 10-11-22 NO = 79.5 ppm
Cylinder No. CC452043 CO = 80.6 ppm
O2 = 0 %

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	80.00	80.50	-0.74	-0.12
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	79.90	79.40	0.50	-0.13

O2 Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O2	0.00	0.00	0.00	0.00	0.00
O2	20.90	20.90	20.90	0.00	0.00

Calibration date. 22/3/2019

Accuracy Target 1%

Resulted PASSED

Calibrated by. Mr. Kitiphum(Engnieer)

Approved by.

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs1 Description HRSG1 Stack Emission Measurements
Process System. SAMPLING SYSTEM
Manufacturer SIEMENS
Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1
Serial no. F-Nr. N1-B1-385

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm
NOx measuring range 0 - 500 ppm O2 measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc
Cirtify Date 9-11.11.-14 Expired Date 10-11.11.-22 NO = 79.5 ppm
Cylinder No. CC452043 CO = 80.6 ppm
O2 = 0 %

Cylinder No.

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	82.10	80.60	1.86	0.00
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	78.40	79.50	-1.38	0.00

O2 Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O2	0.00	0.00	0.00	0.00	0.00
O2	20.90	20.90	20.90	0.00	0.00

Calibration date. 22/4/2019 Accuracy Target 1%
Resulted PASSED
Calibrated by. Mr. Kitiphum(Engnieer) Approved by.

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs2 Description HRSG2 Stack Emission Measurements
Process System. SAMPLING SYSTEM
Manufacturer SIEMENS
Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1
Serial no. F-Nr. N1-X9-008

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm
NOx measuring range 0 - 500 ppm O₂ measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc
Cirtify Date 9-๕.๓.-14 Expired Date 10-๕.๓.-22 NO = 79.5 ppm
Cylinder No. CC452043 CO = 80.6 ppm
O₂ = 0 %

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	83.70	80.60	3.85	0.00
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	81.10	79.50	2.01	0.00

O₂ Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O ₂	0.00	0.00	0.00	0.00	0.00
O ₂	20.90	20.90	20.90	0.00	0.00

Calibration date. 22/4/2019

Accuracy Target 1%

Resulted PASSED

Calibrated by. Mr. Kitiphum(Engnieer)

Approved by.

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs1 Description HRSG1 Stack Emission Measurements
Process System. SAMPLING SYSTEM
Manufacturer SIEMENS
Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1
Serial no. F-Nr. N1-B1-385

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm
NOx measuring range 0 - 500 ppm O₂ measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc
Cirtify Date 9-ธ.ค.-14 Expired Date 10-ธ.ค.-22 NO = 79.5 ppm
Cylinder No. CC452043 CO = 80.6 ppm
O₂ = 0 %

Cylinder No.

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	80.70	80.70	0.12	0.12
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	79.00	79.50	-0.63	0.00

O₂ Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O ₂	0.00	0.00	0.00	0.00	0.00
O ₂	20.90	20.90	20.90	0.00	0.00

Calibration date. 29/5/2019 Accuracy Target 1%
Resulted PASSED
Calibrated by. Mr. Kitiphum(Engnieer) Approved by.

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs2 Description HRSG2 Stack Emission Measurements

Process System. SAMPLING SYSTEM

Manufacturer SIEMENS

Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1

Serial no. F-Nr. N1-X9-008

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm

NOx measuring range 0 - 500 ppm O₂ measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc

Cirtify Date 9-๑.๓.-14 Expired Date 10-๑.๓.-22 NO = 79.5 ppm

Cylinder No. CC452043 CO = 80.6 ppm

O₂ = 0 %

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	82.40	80.50	2.23	-0.12
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	78.00	79.50	-1.89	0.00

O₂ Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O ₂	0.00	0.00	0.00	0.00	0.00
O ₂	20.90	20.90	20.90	0.00	0.00

Calibration date. 29/5/2019

Accuracy Target 1%

Resulted PASSED

Calibrated by. Mr. Kitiphum(Engnieer)

Approved by. _____

CALIBRATION REPORT

Continuous Emission Monitoring System Two Point Calibration

Tag.no. CEMs1 Description HRSG1 Stack Emission Measurements
Process System. SAMPLING SYSTEM
Manufacturer SIEMENS
Type / Model ULTRAMAT 23 7MB2337-4AD10-3PE1
Serial no. F-Nr. N1-B1-385

NO measuring range 0 - 500 ppm CO measuring range 0 - 250 ppm
NOx measuring range 0 - 500 ppm O₂ measuring range 0 - 25 %

STANDARD GAS CAL

Manufacturer Air Liquide America Standard Gas Conc
Cirtify Date 9-11.11.-14 Expired Date 10-11.11.-22 NO = 79.5 ppm
Cylinder No. CC452043 CO = 80.6 ppm
O₂ = 0 %

Cylinder No.

IR Calibration

Gas Componet	Gas Conc (ppm)	As found (ppm)	AS left (ppm)	Asfound error (% of FS)	Asleft error (% of FS)
CO	0.00	0.00	0.00	0.00	0.00
CO	80.60	82.1	80.50	#VALUE!	-0.12
NO	0.00	0.00	0.00	0.00	0.00
NO	79.50	78.40	79.50	-1.38	0.00

O₂ Calibration

Gas Componet	Gas Conc (%)	As found (%)	AS left (%)	Asfound error (% of FS)	Asleft error (% of FS)
O ₂	0.00	0.00	0.00	0.00	0.00
O ₂	20.90	20.90	20.90	0.00	0.00

Calibration date. 25/6/2019 Accuracy Target 1%
Resulted PASSED
Calibrated by. Mr. Kitiphum(Engnieer) Approved by.

